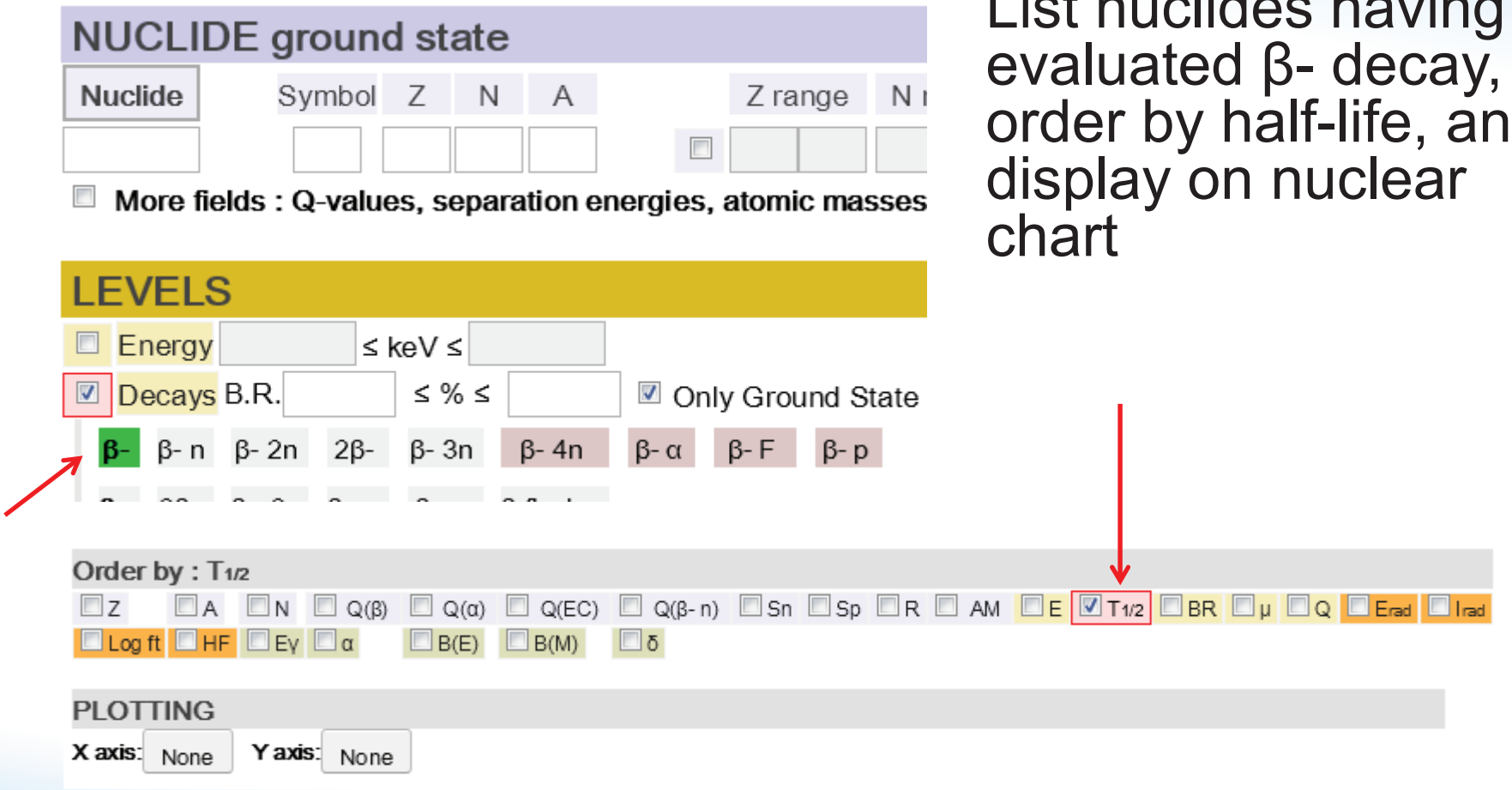
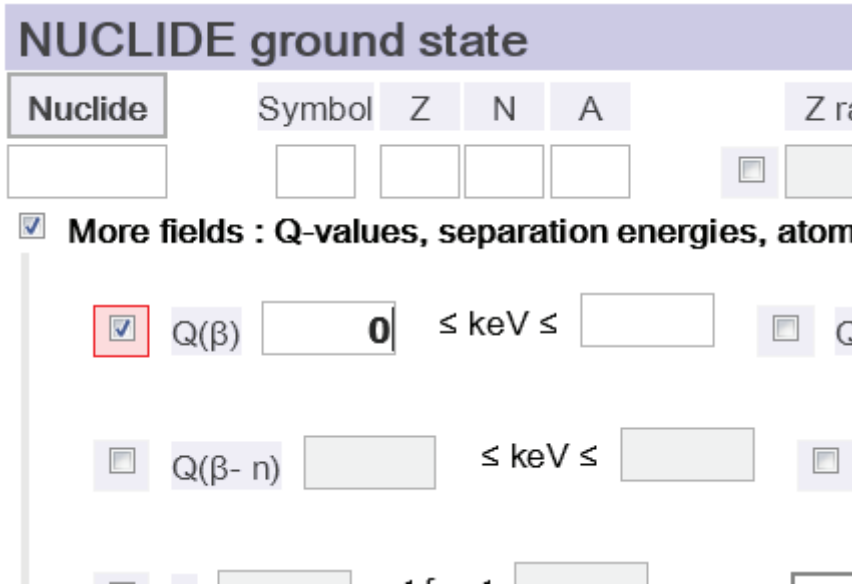
Query Tool exercises with solution

www-nds.iaea.org/queryensdf

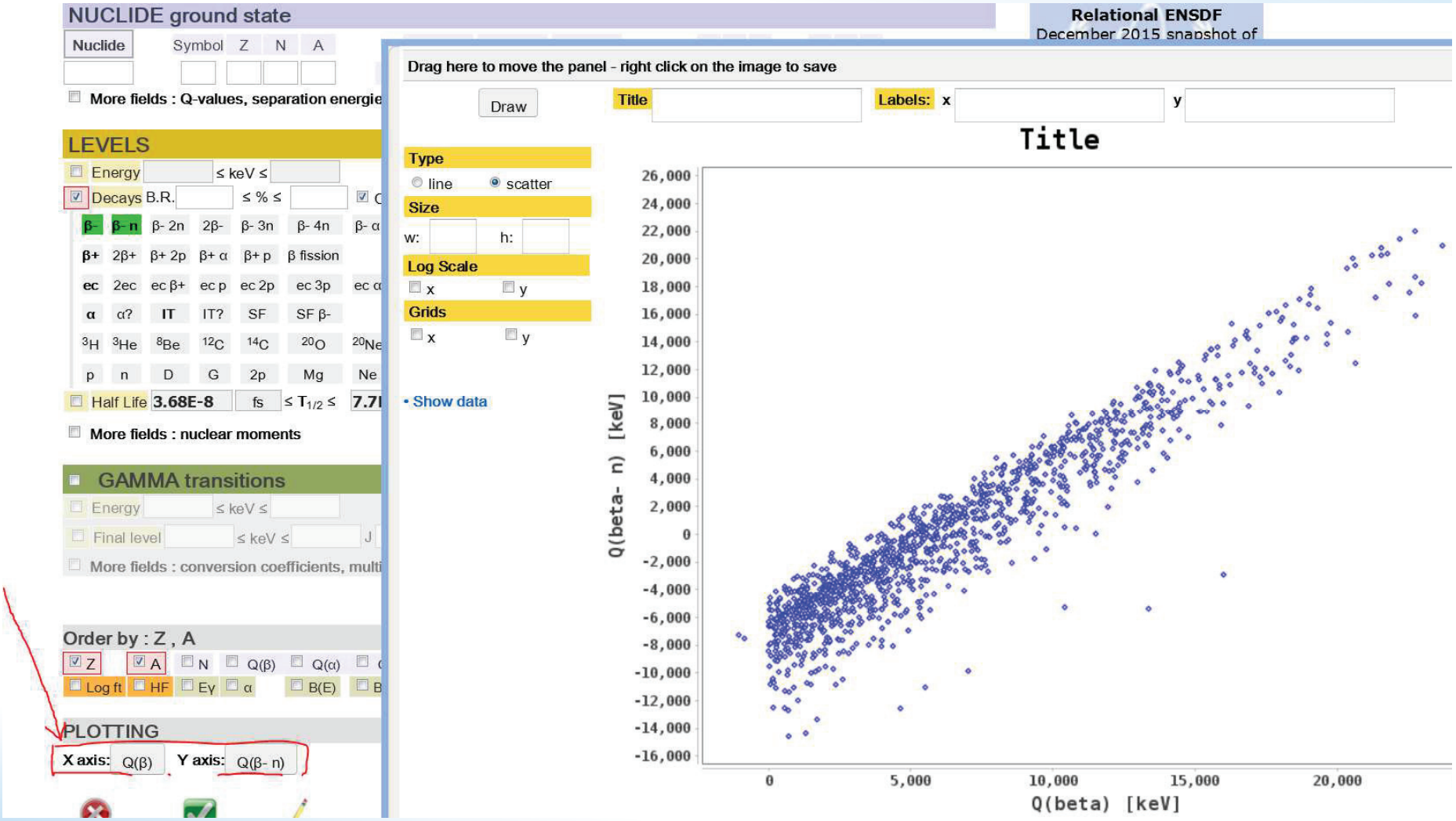


List nuclides having an evaluated β- decay, order by half-life, and display on nuclear chart

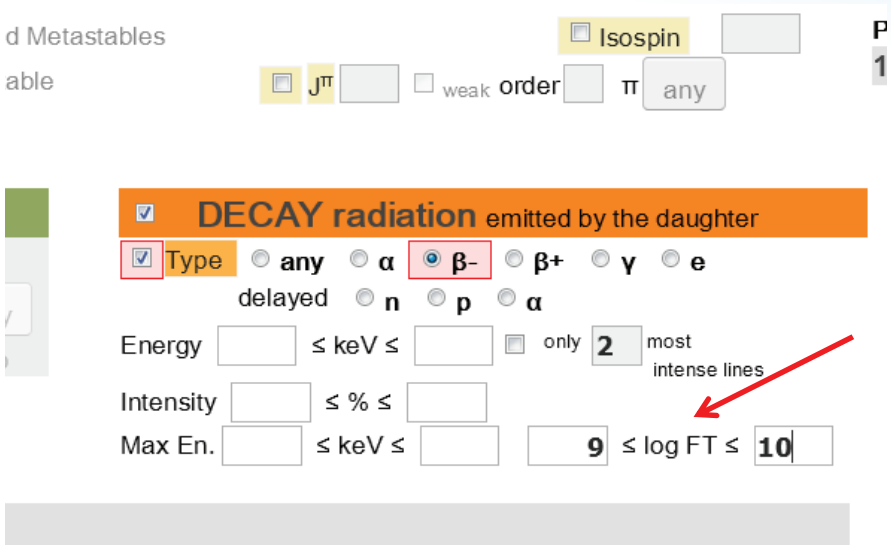
List nuclides that can theoretically β decay. Compare with the results before



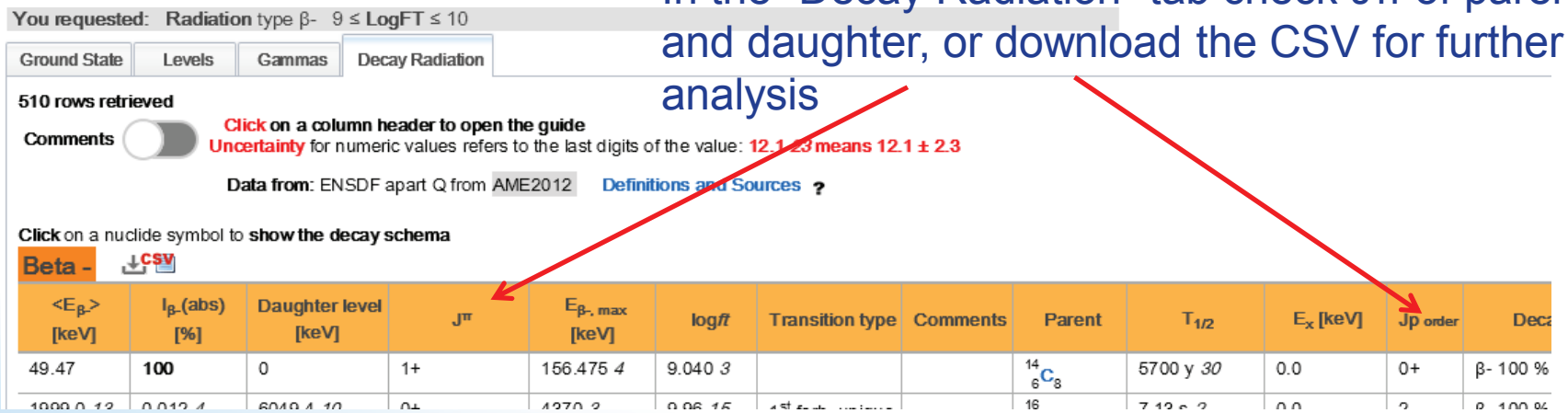
Plot Q_{β} against $Q_{\beta- n}$ for those nuclides with evaluated β- and β- n decay



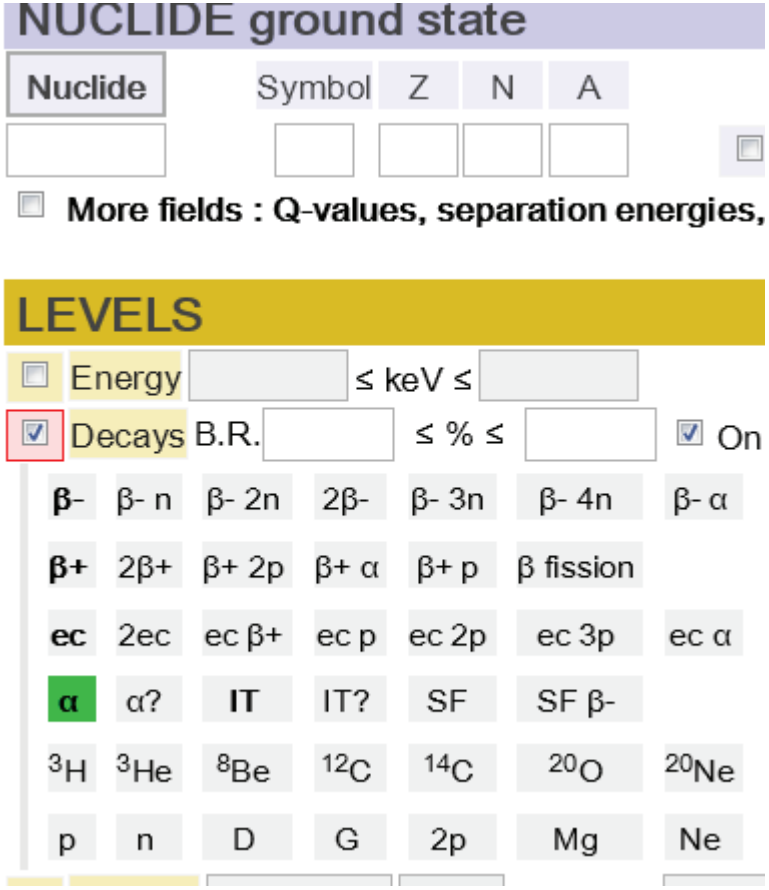
Find β- decaying nuclides which have β transitions with 9 ≤ log ft ≤ 10. Check ΔJ and Δπ values.



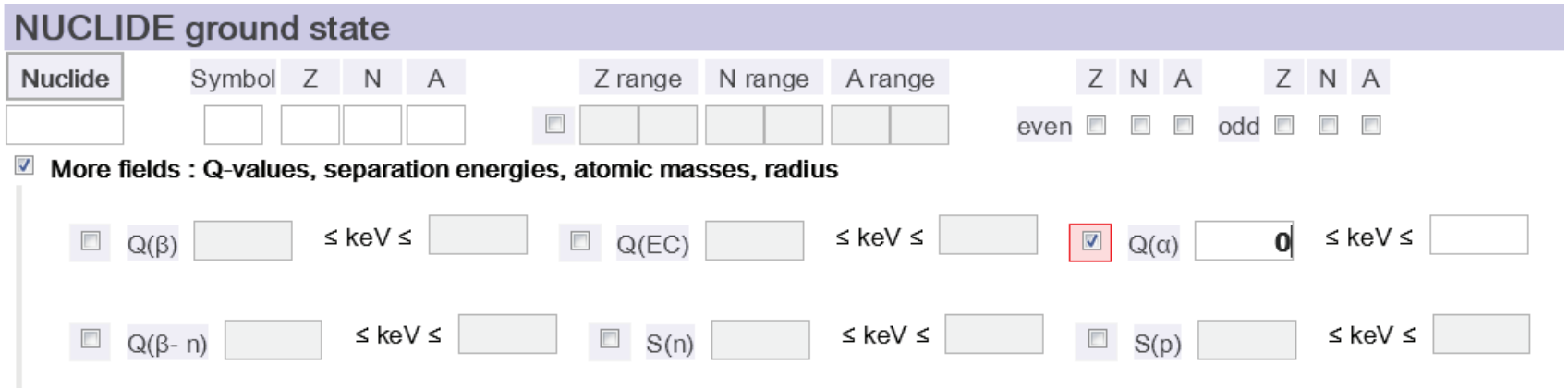
In the "Decay Radiation" tab check Jπ of parent and daughter, or download the CSV for further analysis



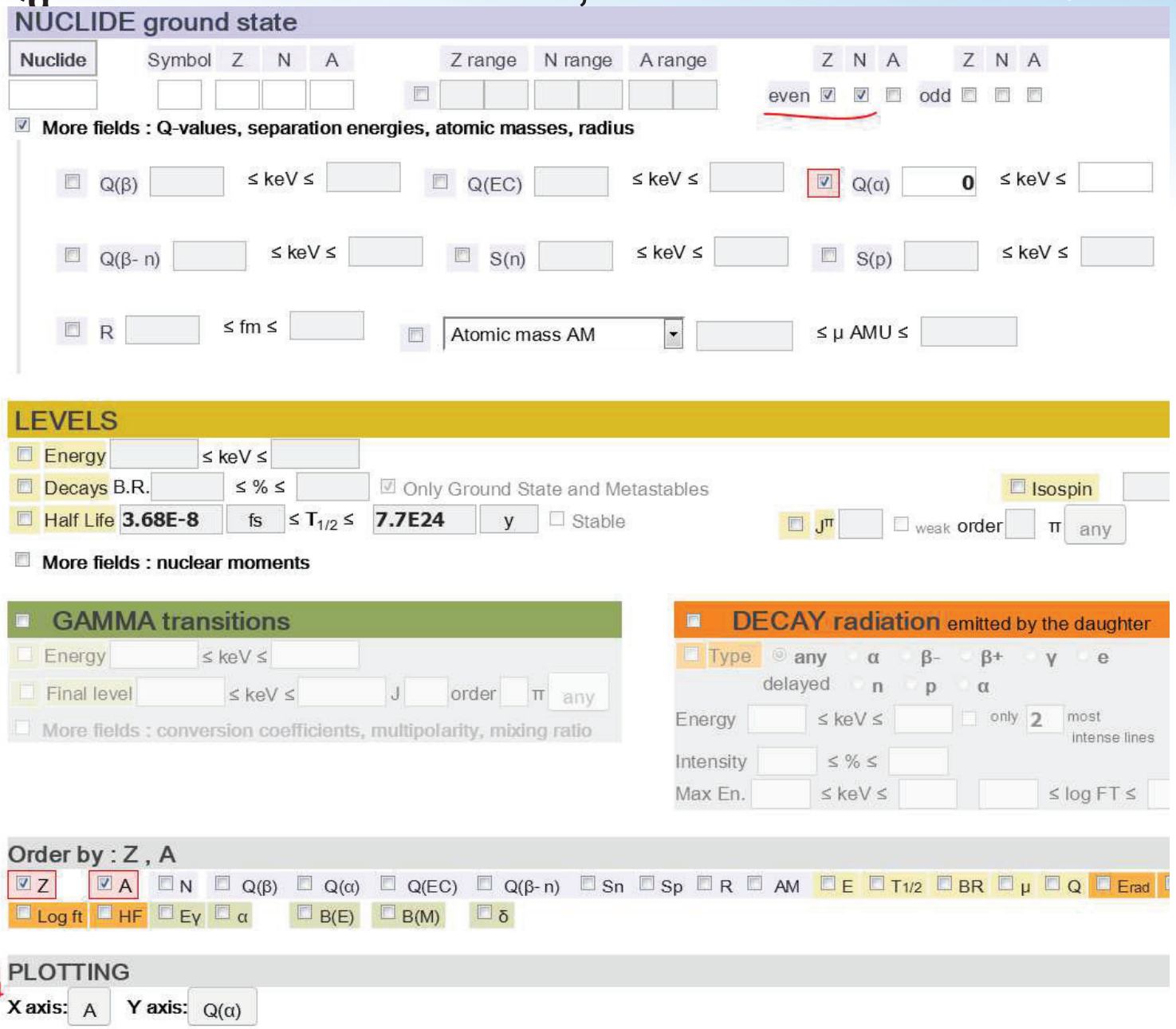
List nuclides with evaluated α decay and display on nuclear chart



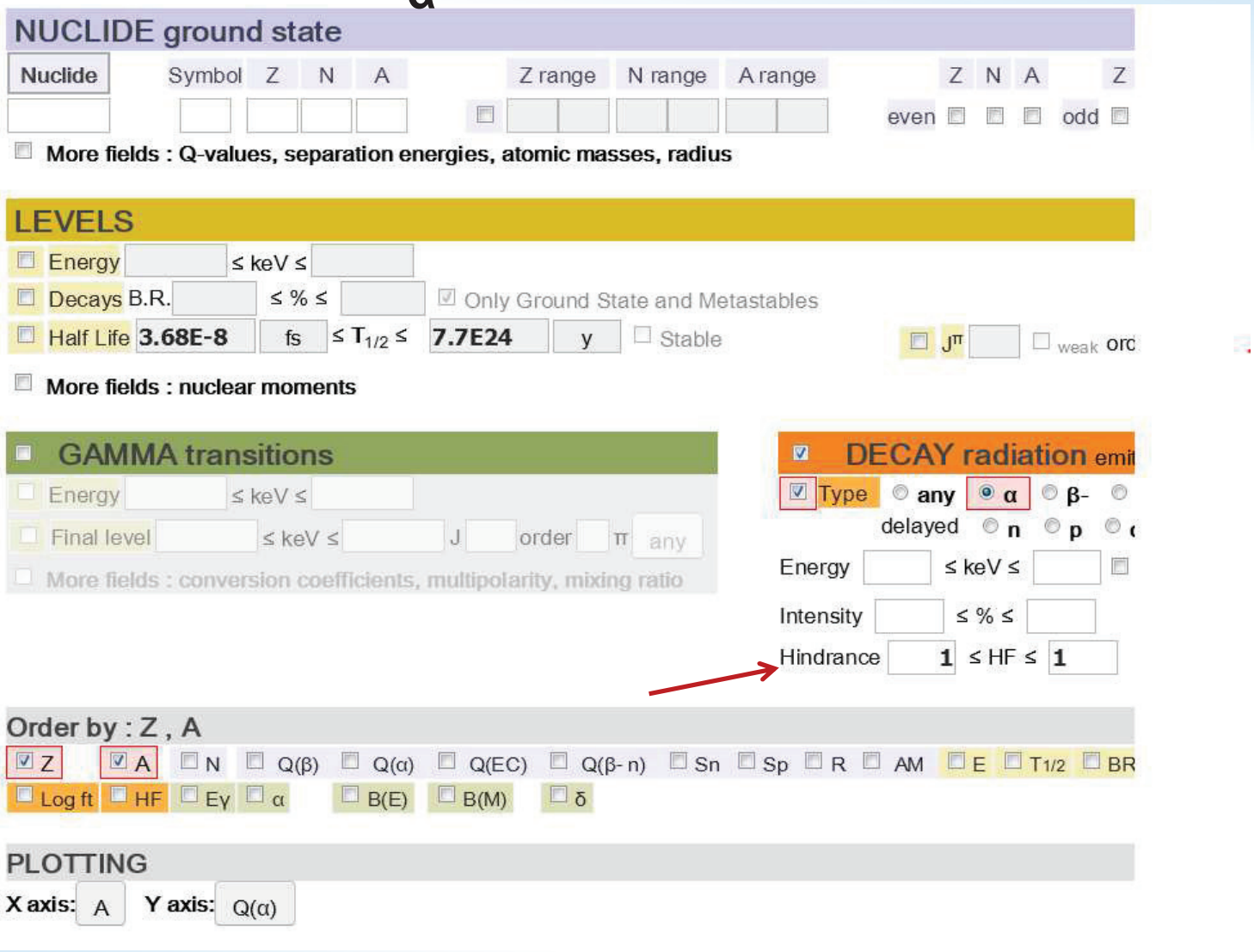
List nuclides that can theoretically α decay and compare with the retrieval before



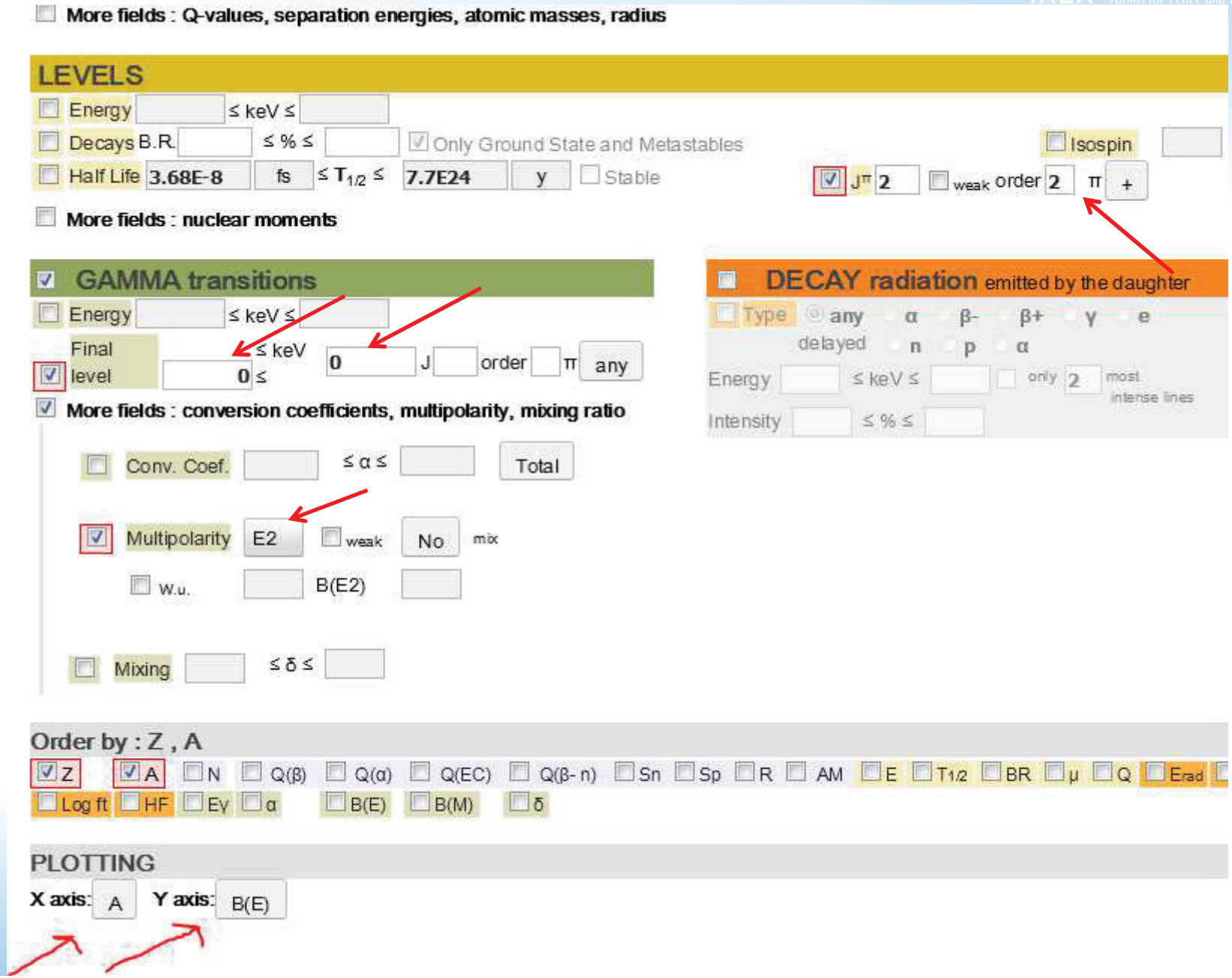
Plot Q_α vs A for even-even,



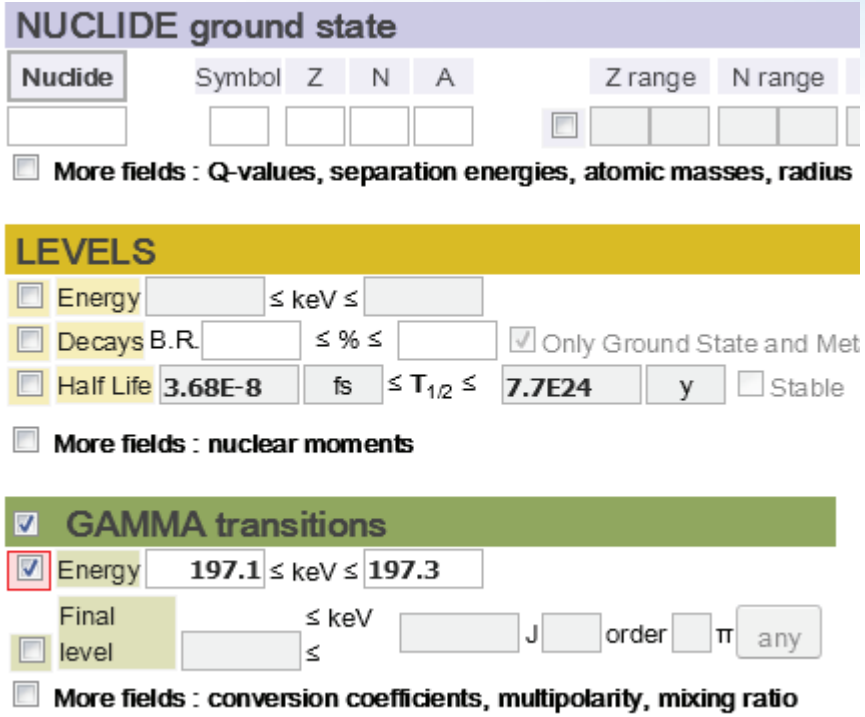
- Find α decaying nuclides with Hindrance Factor HF=1. Plot Q_α vs A.



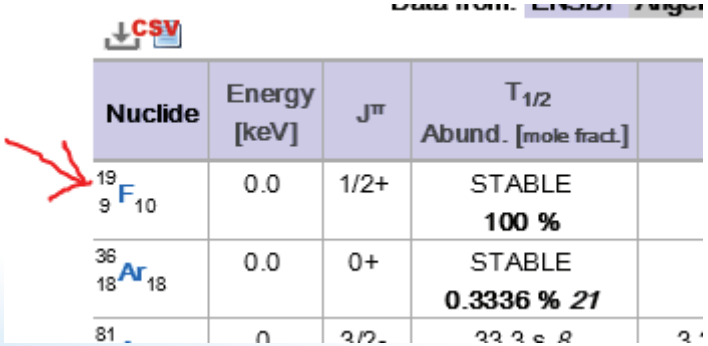
Plot $B(E_2)$ strengths of transitions from first excited 2^{+} states to the ground state vs A



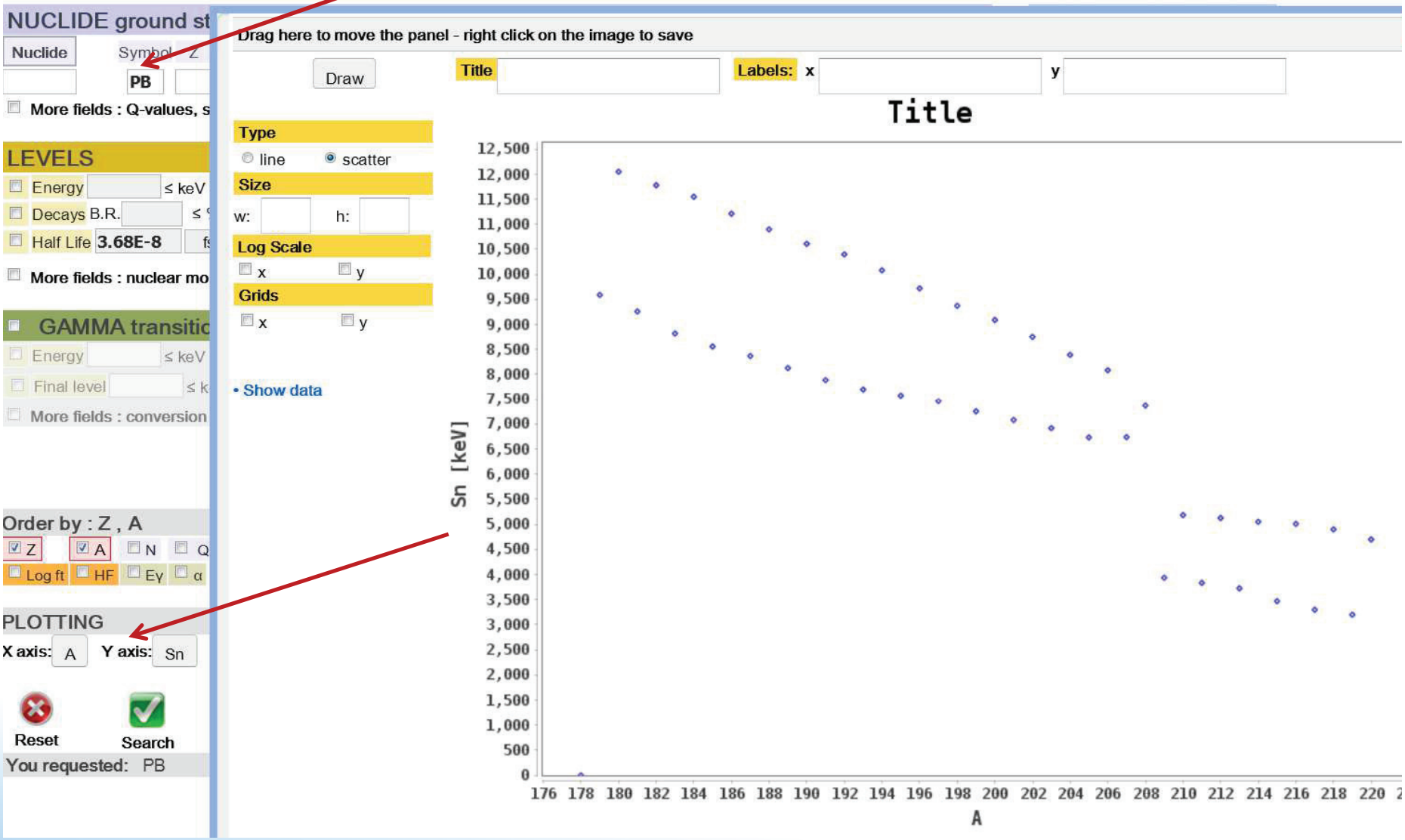
Find nuclides which emit γ rays of energy 197.2 keV through internal transitions and induced reactions.



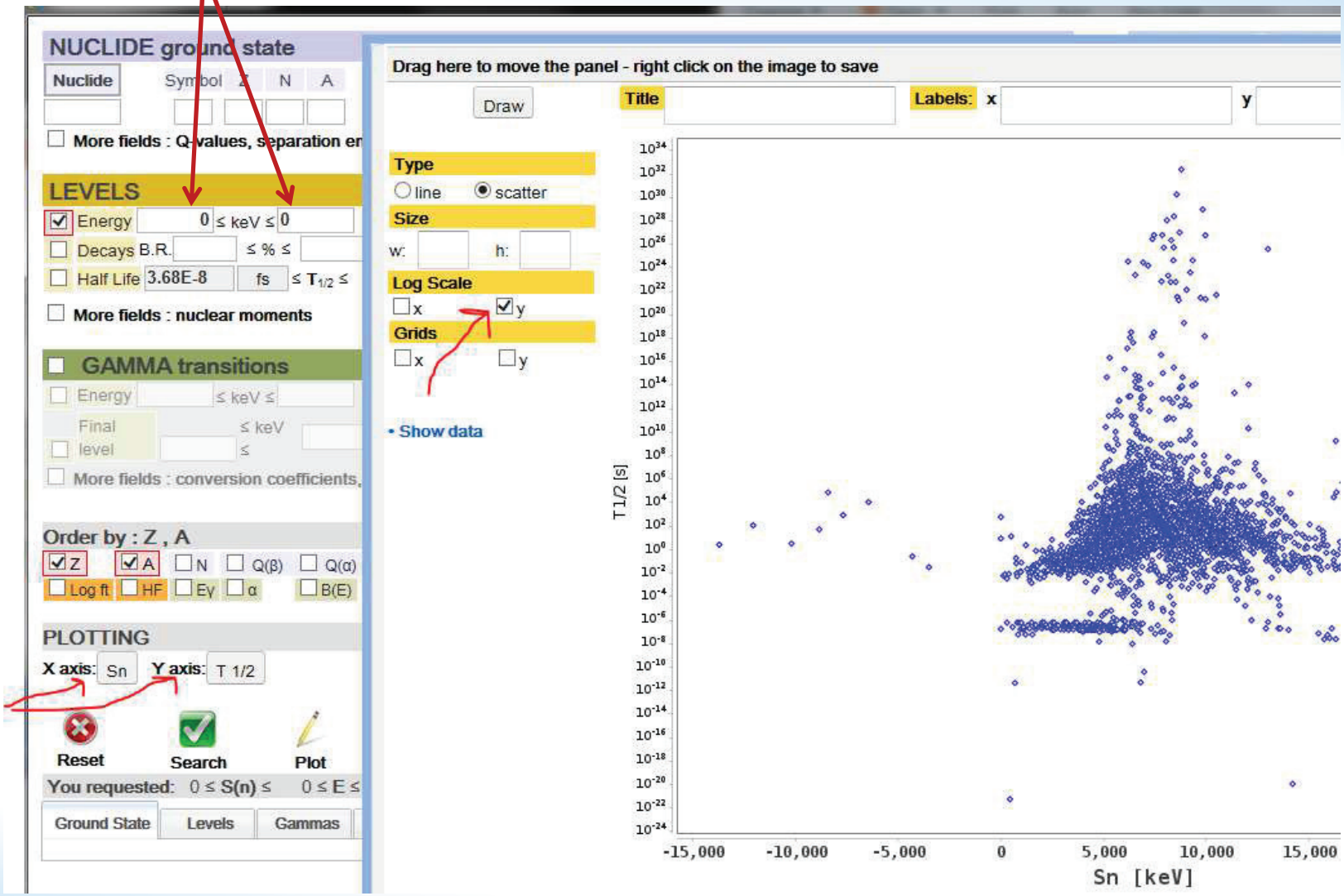
In the results, take 19-F and plot its level schema



Plot S_n vs A for Led



Plot ground states S_n vs $T_{1/2}$



Plot A vs $T_{1/2}$ for Z ≤ 100 levels decaying via β-n for which there is an evaluated n emission

NUCLIDE ground state

Nuclide | Symbol | Z | N | A | Z range | N

☑ 100

☐ More fields : Q-values, separation energies, atomic masses

LEVELS

☐ Energy ≤ keV ≤

☑ Decays B.R. ≤ % ≤ ☑ Only Ground State

β- | **β- n** | β- 2n | 2β- | β- 3n | β- 4n | β- α | β- F | β- p

β+ | 2β+ | β+ 2p | β+ α | β+ p | β fission

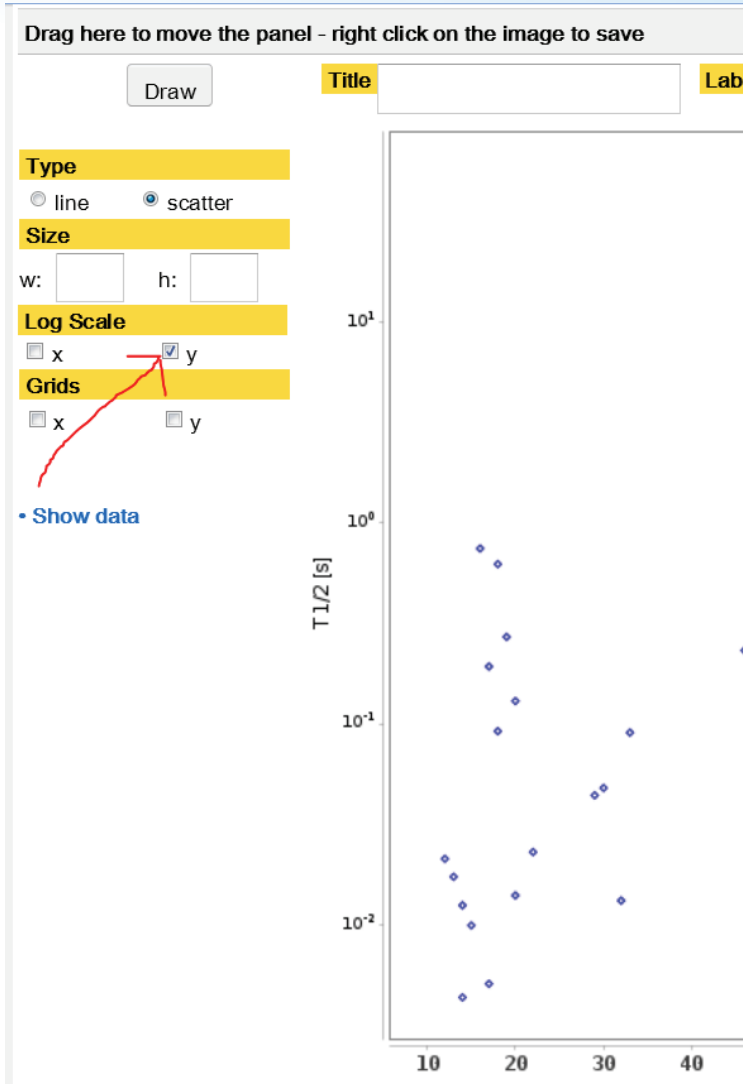
☑ **DECAY radiation** emitted by the daughter

☑ Type ○ any ○ α ○ β- ○ β+ ○ γ ○ e

delayed ◉ n ○ p ○ α

Energy ≤ keV ≤ ☐ only 2 most intense lines

Intensity ≤ % ≤



- Plot A vs δ for E_2/M_1 transitions from J^{π} $2^{`+}$ to 2^+ for e-e nuclides having $60 \leq A \leq 150$.

In this section we consider the excited states as members of quasirotational bands. Figure 3 illustrates how the multiple-phonon levels may be decomposed into various intrinsic excitations

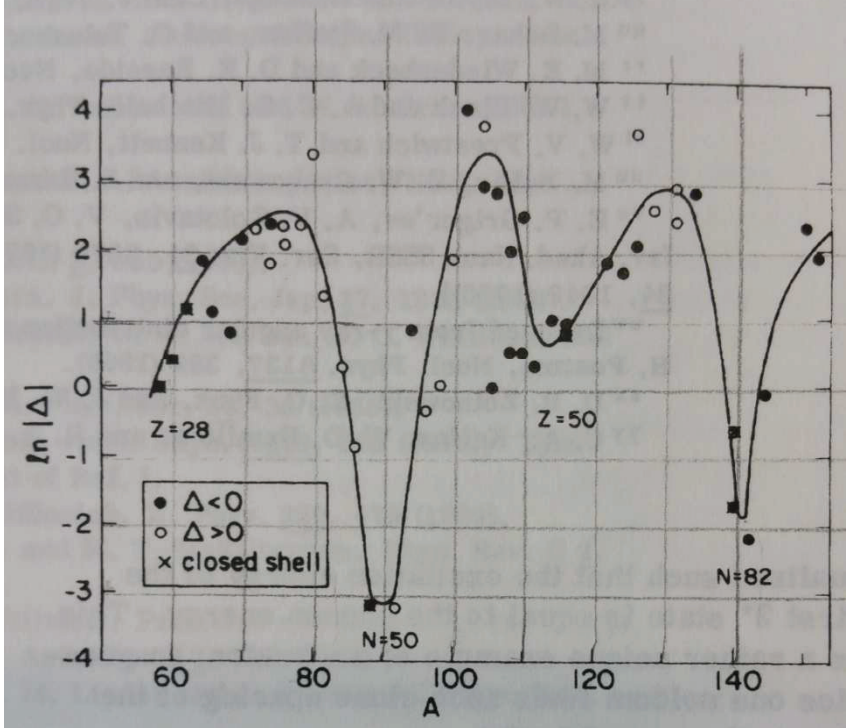


FIG. 2. $E2/M1$ mixing ratios of $2' \rightarrow 2$ transitions in even-even nuclei $60 \lesssim A \lesssim 150$. The solid curve indicates the trend of the measured values and shows pronounced minima in the vicinity of closed shells.

K.S. Krane, Phys.Rev. C 10 (1974) 1197
(Δ is a function of δ)

SEE NEXT PAGE

- Plot A vs δ for E_2/M_1 transitions from J^{π} 2`+ to 2^+ for e-e nuclides having 60 ≤ A ≤ 150.